

BIRD STRIKES TO AIRCRAFT AT NIGHT AND THEIR MANAGEMENT, FOCUSING ON RED-WATTLED LAPWING *Vanellus indicus* (BODDAERT)

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Bird strikes cause considerable damage to aircraft and substantial numbers of strikes take place at night. While the problem during the day is relatively manageable, strikes at night have to be addressed differently. An analysis of the historical data indicated that Red-wattled Lapwing *Vanellus indicus* caused the highest number of strikes. To find ways of reducing strikes from this species, its behaviour and activity pattern was observed periodically, and from review of literature. The strikes reduced after adopting preventive measures during nights around full moon.

Key words: bird-hit, Indian Air Force, full moon night, Red-wattled Lapwing

INTRODUCTION

Bird strikes to aircraft are a natural hazard in aviation and cause considerable damage to aircraft resulting in economic loss and loss of human life. In case of military aviation, the aircraft is not available for operations for the period of repair. This has a bearing on the combat potential and training schedule of the forces. Bird strikes happen both during the day and night. During the day the problem can be fairly managed through birdwatchers with wireless radio communicators who report the presence of birds in the approach or take off path; accordingly, necessary changes are made in the aircraft in landing or take off. Bird strikes take place both during the day and night, about 10% occurring at night. This brought up the need to investigate the problem in a systematic way, understand it and find appropriate solutions to avoid the incidents.

MATERIAL AND METHODS

The study involved collation of historical data on the bird species involved in bird strikes during nights, available at various air force stations. The species involved in bird strikes during 2011 were identified with the help of LaCONES (Hyderabad). Earlier identifications were made at the station level looking at the carcass or through comparison with museum specimens at the Bombay Natural History Society (BNHS). The data showed that the Red-wattled Lapwing was involved notably in night bird strikes. A review of literature on the species was carried out. The dates, from 1995, on which bird strikes by lapwings occurred during nights were recorded. The strike dates with reference to their breeding and post breeding cycle were also examined. Field observations were made on the activity / behaviour of the species in some Air Force stations, both in the general areas and in the aircraft

manoeuvring areas (Fig. 1).

Upon observing higher bird activity around full moon nights, 'cautionaries' (a term used in aviation on issue of specific caution at a place for a specific time period) were issued to restrict operations on nights around the full moon. A mechanism for enhanced vigilance by scanning the runway (RW) with powerful lights, before take offs and landings was also instituted.

RESULTS AND DISCUSSION

Data on 975 bird strikes incidents since 2000 (and 4 incidents since 1995) of stations of the Indian Air Force spread all over the country was collated. Of 975 incidents, species were identified only in 224 incidents. Of the



Fig.1: A Red-wattled Lapwing stuck on the landing gear of an aircraft

224 incidences, only 46 were night strikes. Table 1 lists the species involved in the night bird strike incidents and their frequency of strike; of these, the Lapwing species singularly contributed up to 58% of strikes. Lapwings are known to be active during the day and night, and Milson (1984) indicated that they normally feed during the day, but reversed their behaviour for a few days around full moon nights. Their feeding and other activity also depend on other environmental factors such as temperature, rain, and food availability.

Considering this, an analysis was carried out comparing the dates of incidents of bird strikes by lapwing in relation with the dates of full moon nights on the calendar. The findings revealed that bird strikes of lapwings all occurred in the nights around full moon nights (Table 2). Of the 32 incidents involving lapwings (including five prior to 2000), 23 took place between -7 and +7 nights around full moon, suggesting these 14 days as the most vulnerable nights for bird strikes by lapwings. The 'vulnerable period' was further reduced by observing that 20 of these incidents took place between -7 to +1 nights from full moon. Hence, the most vulnerable time period was from 14 nights (which is 50% nights) to 8 nights (c. 26% nights) in a month. All the 23 strikes occurred during the breeding season of the species (April-November). In contrast, day strikes occurred during the breeding and non-breeding seasons (data not given here).

The maximum strikes (17/23) occurred between July and September. It was observed that the eggs hatch around July and continues till September at different parts of the country.

Table 1: Bird species involved in strikes against IAF aircraft (at night) and the number of incidents since 2000

Species*	No. of hits
Lapwings (includes Red- and Yellow-wattled)	27
Sparrow and others	4
Owls	3
Nightjars	2
Parakeet	2
Stone Curlew	1
Cattle Egret	1
Bee-eater	1
Pigeon	1
House Swift, Swallow	1+1
Greater Short-toed Lark and Crested Lark	1+1
Total	46

* In addition, there were six strikes by bats

Table 2: Month-wise distribution of lapwing bird strikes during the night*

Month	No. of hits
Apr	2
May	1
Jun	1
Jul	6
Aug	3
Sep	8
Oct	1
Nov	1

*All strikes are around full moon nights (-7 to +7)

Considering these, the field units were given instructions to deploy a Bird Hazard Combat Team (BHCT) during the most vulnerable nights (-7 to +1 night from full moon night). The teams were given powerful lights to scan and scare the birds away, and pre-flight surveys of the ground were done and flying activity was cancelled, if the bird activity was found to be high. Specific instruction was also issued to restrict flying at least +/-1 night around the full moon night. Another labour intensive job was to identify and shift the nests away gradually (100-150 m/day) from the aircraft manoeuvring area. This was expected to keep the birds, especially the chicks away from the vulnerable zone. The stations were instructed to grow long grass (25 to 40 cm) between June and November, as long grass area is not a preferred habitat for this species.

CONCLUSIONS

This study and ensuing precautionary steps taken up by the IAF have resulted in zero night bird strikes by lapwing during July-October 2011. This indicates that the presumptions and inferences made from the study were fairly accurate. However, they need to be evaluated and confirmed over a longer period collecting more robust data. These results will be put into test again in 2012. With the help of DNA bar-coding techniques, the success rate in identifying bird strike species has gone up exponentially and will help in understanding the problem, and arriving at realistic solutions. That will help to ensure safer operations for military and civil flights.

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REFERENCE

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